

CLAIMS

1. A thermoelectric module comprising support
substrates, a plurality of wiring conductors formed on
5 the opposing surfaces of the support substrates, a
plurality of thermoelectric elements, and solder layers
formed between said wiring conductors and said
thermoelectric elements, wherein the total projected
10 area (Sv) of voids contained in said solder layers
projected onto the surfaces of the support substrates on
the side where the solder layers are in contact via the
wiring conductors is from 1 to 20% of the total area
(St) of the surfaces on where the solder layers are in
contact with the wiring conductors.
- 15 2. A thermoelectric module according to claim 1,
wherein said thermoelectric elements are provided with
plated layers on the surfaces in contact with the solder
layers.
- 20 3. A thermoelectric module according to claim 2,
wherein said plated layers are formed by plating with
nickel and/or gold.
4. A thermoelectric module according to claim 1,
wherein said solder layers have an average thickness of
10 to 50 μm .
- 25 5. A thermoelectric module according to claim 1,
wherein the voids contained in said solder layers have
an average diameter of 1 to 100 μm .
6. A thermoelectric module according to claim 1,
wherein said voids have nearly a circular shape when
30 they are projected onto the surfaces of the support
substrates on the side in contact via said wiring
conductors.
7. A thermoelectric module according to claim 1,
wherein said solder layer comprises an Sn-Sb solder
35 and/or an Au-Sn solder.

8. A thermoelectric module according to claim 1, wherein said thermoelectric elements contain at least two or more kinds of elements selected from the group consisting of Bi, Sb, Te and Se.

5 9. A process for producing a thermoelectric module having at least support substrates, a plurality of wiring conductors formed on the opposing surfaces of the support substrates and a plurality of thermoelectric elements, by applying a solder paste containing a void-
10 forming agent onto the surfaces of either the wiring conductors or the thermoelectric elements in the thermoelectric module, and joining said wiring
conductors and said thermoelectric elements together by the heat treatment.

15 10. A process for producing a thermoelectric module according to claim 9, wherein the total projected area (Sv) of voids contained in said solder layers
projected onto the surfaces of the support substrates on the side where the solder layers are in contact via the
20 wiring conductors is from 1 to 20% of the total area (St) of the surfaces on where the solder layers are in contact with the wiring conductors.

25 11. A process for producing a thermoelectric module according to claim 9, wherein said paste is prepared by using at least a solder powder and a void-
forming agent, the void-forming agent being a resin having a melting point lower than that of the solder powder.

30 12. A process for producing a thermoelectric module according to claim 11, wherein said solder powder has a melting point which is not higher than 400°C.